

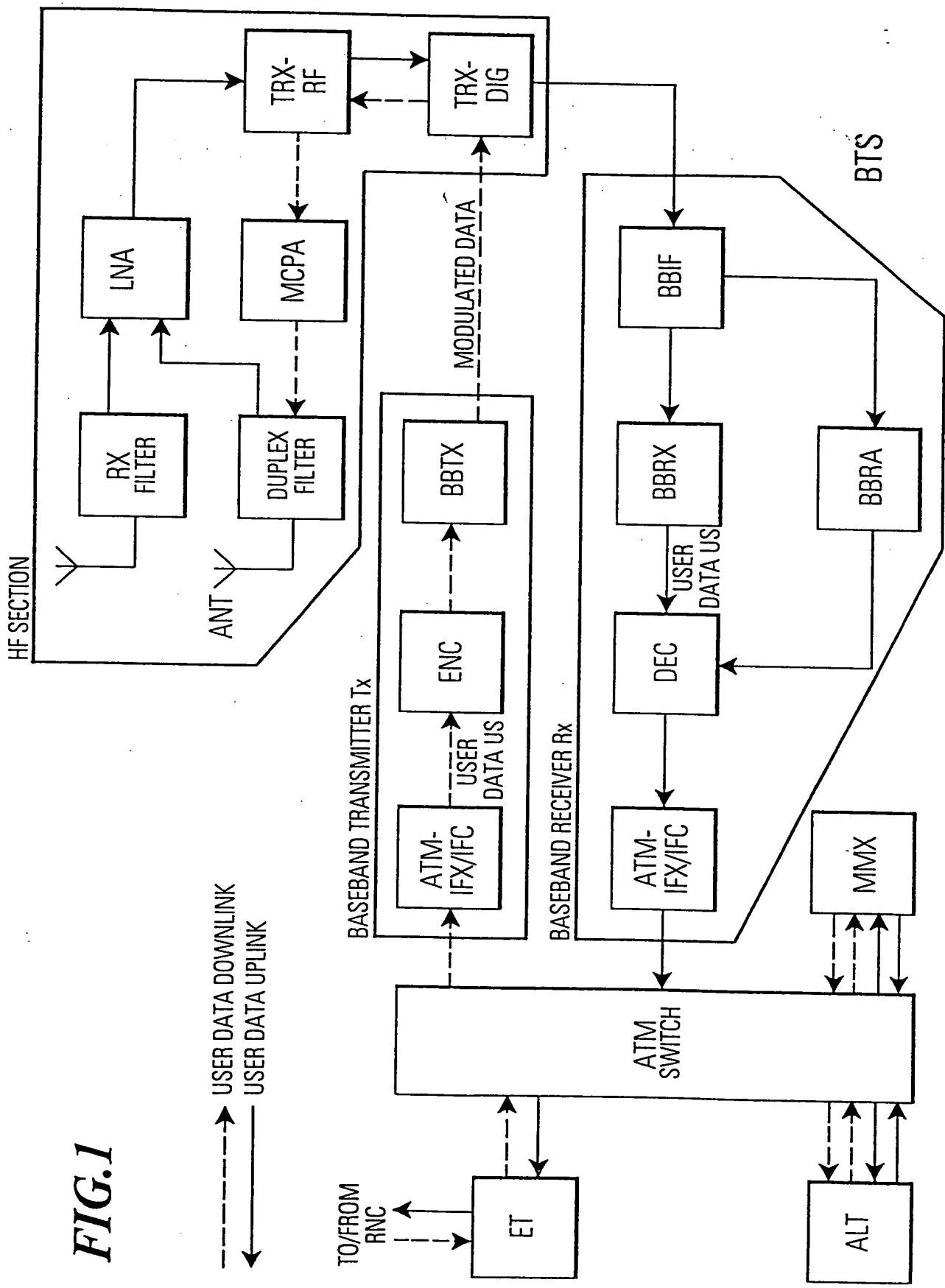
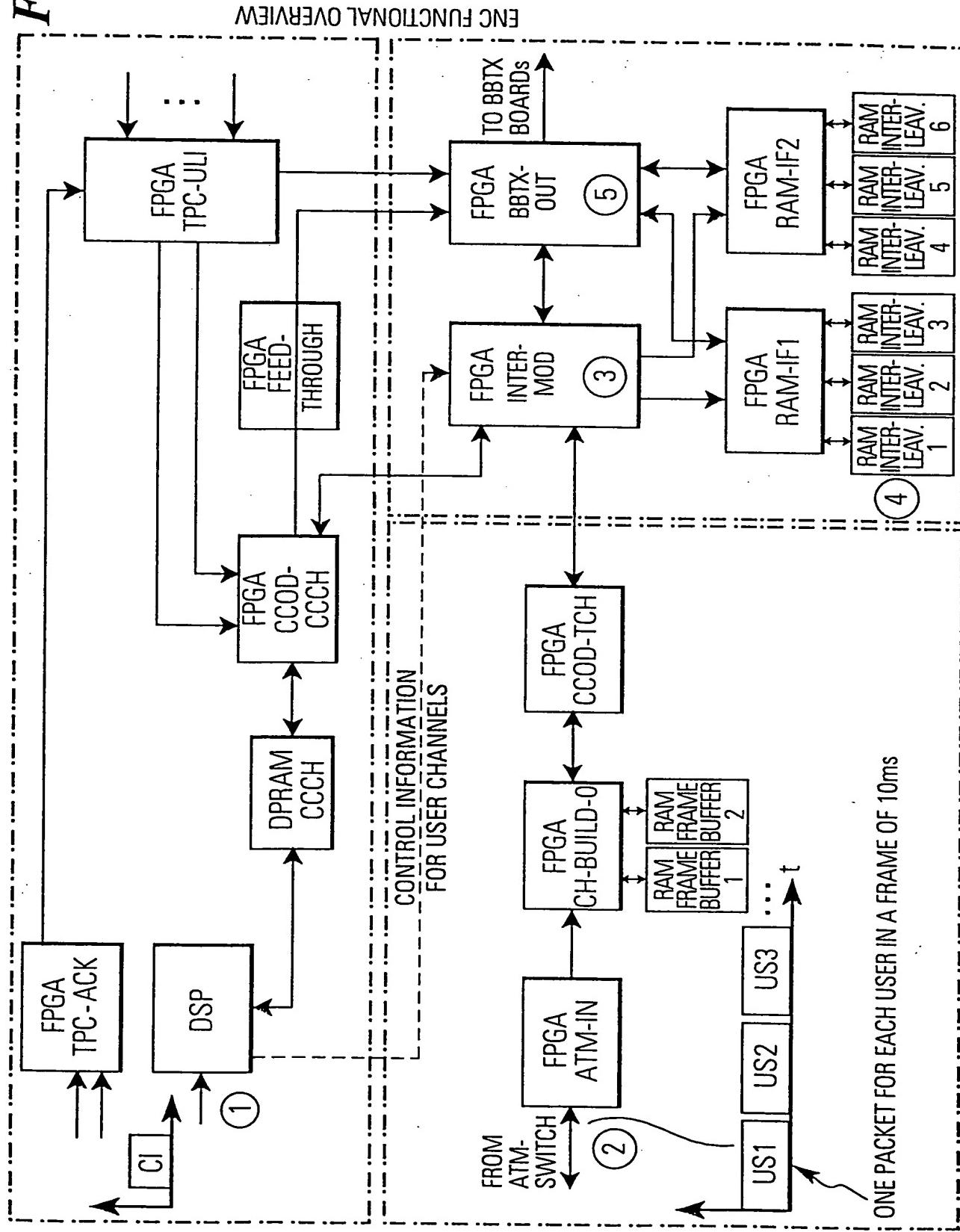
FIG.1

FIG. 2



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FIG.3

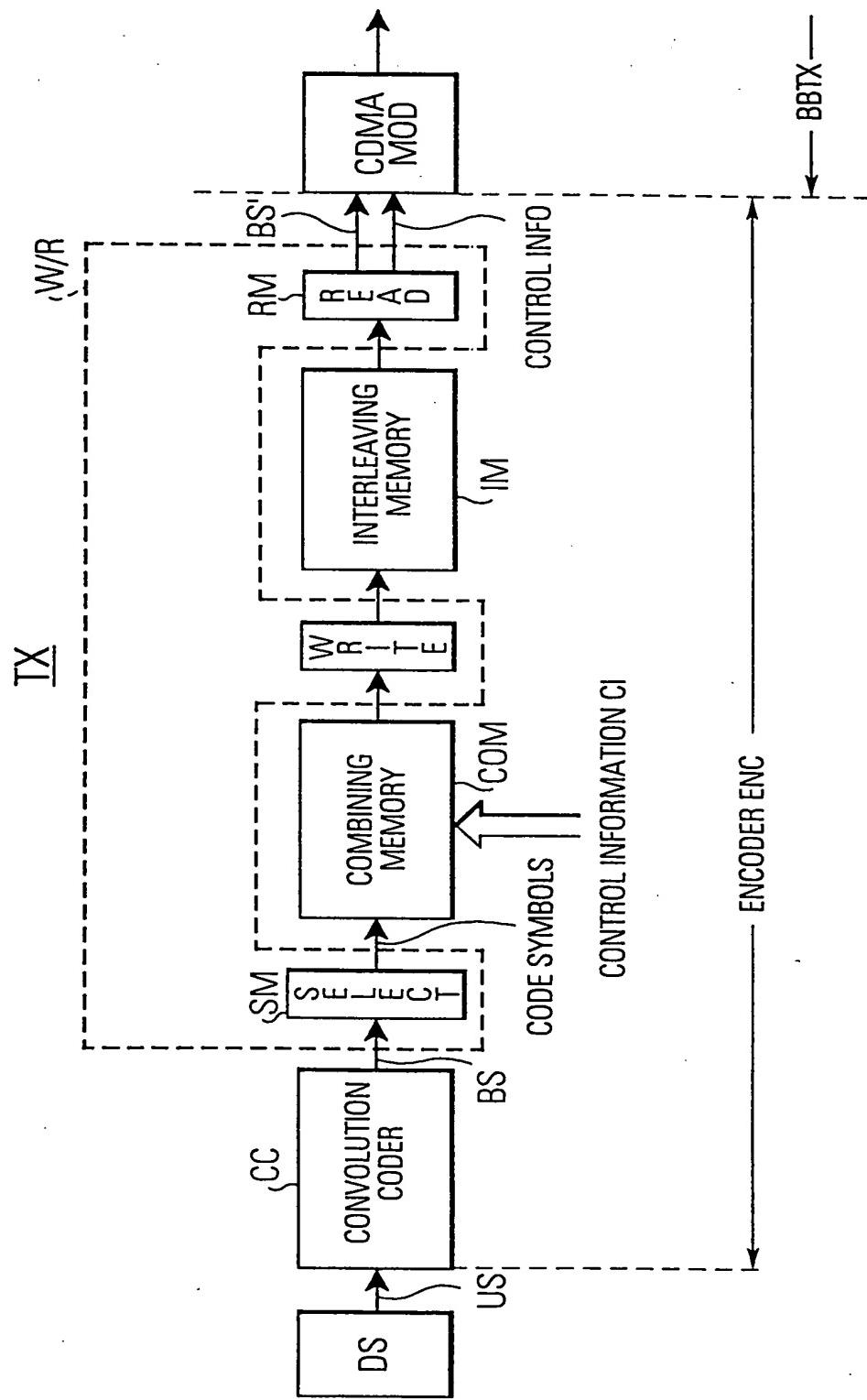


FIG.4 PRIOR ART

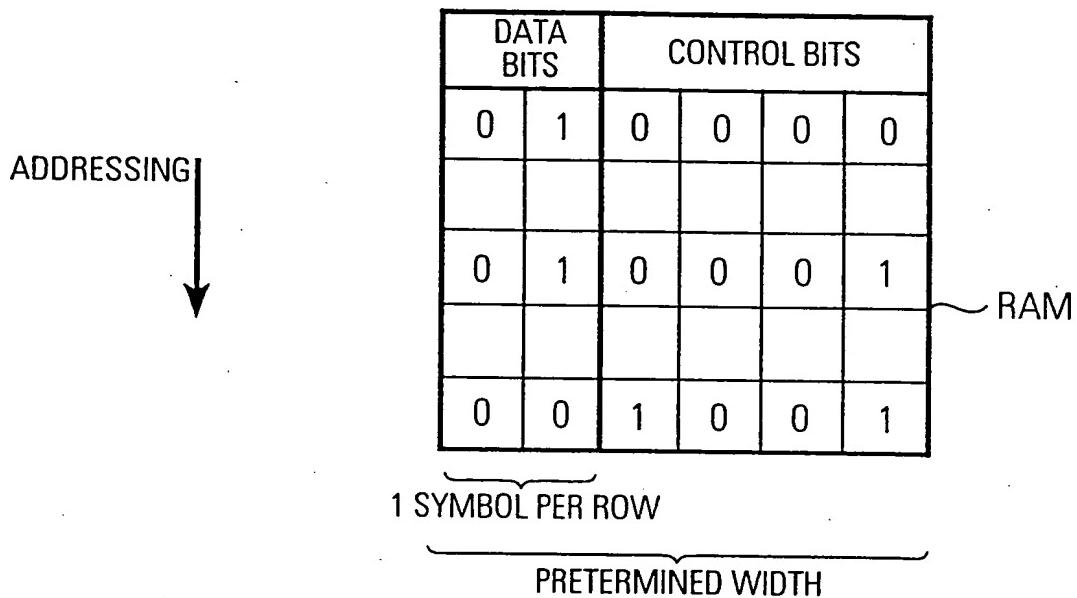
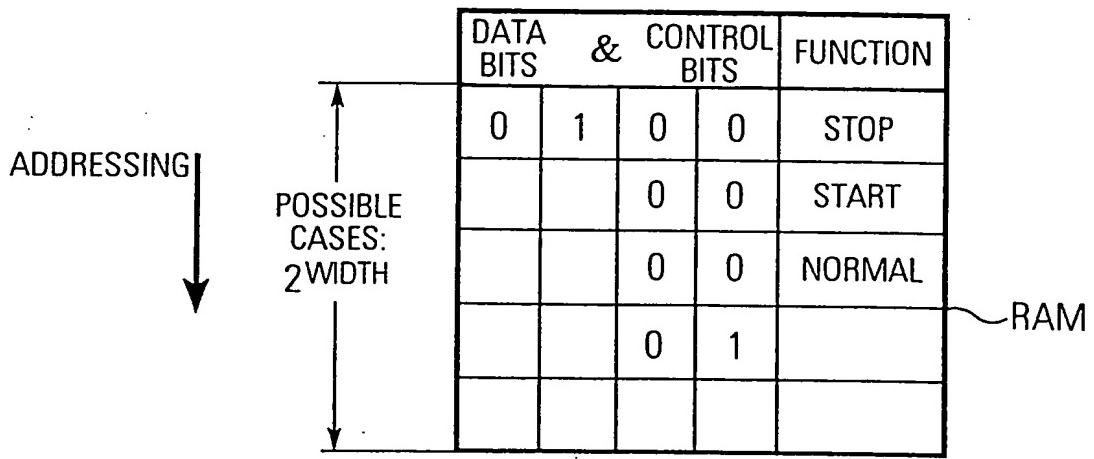


FIG.7



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FIG. 6

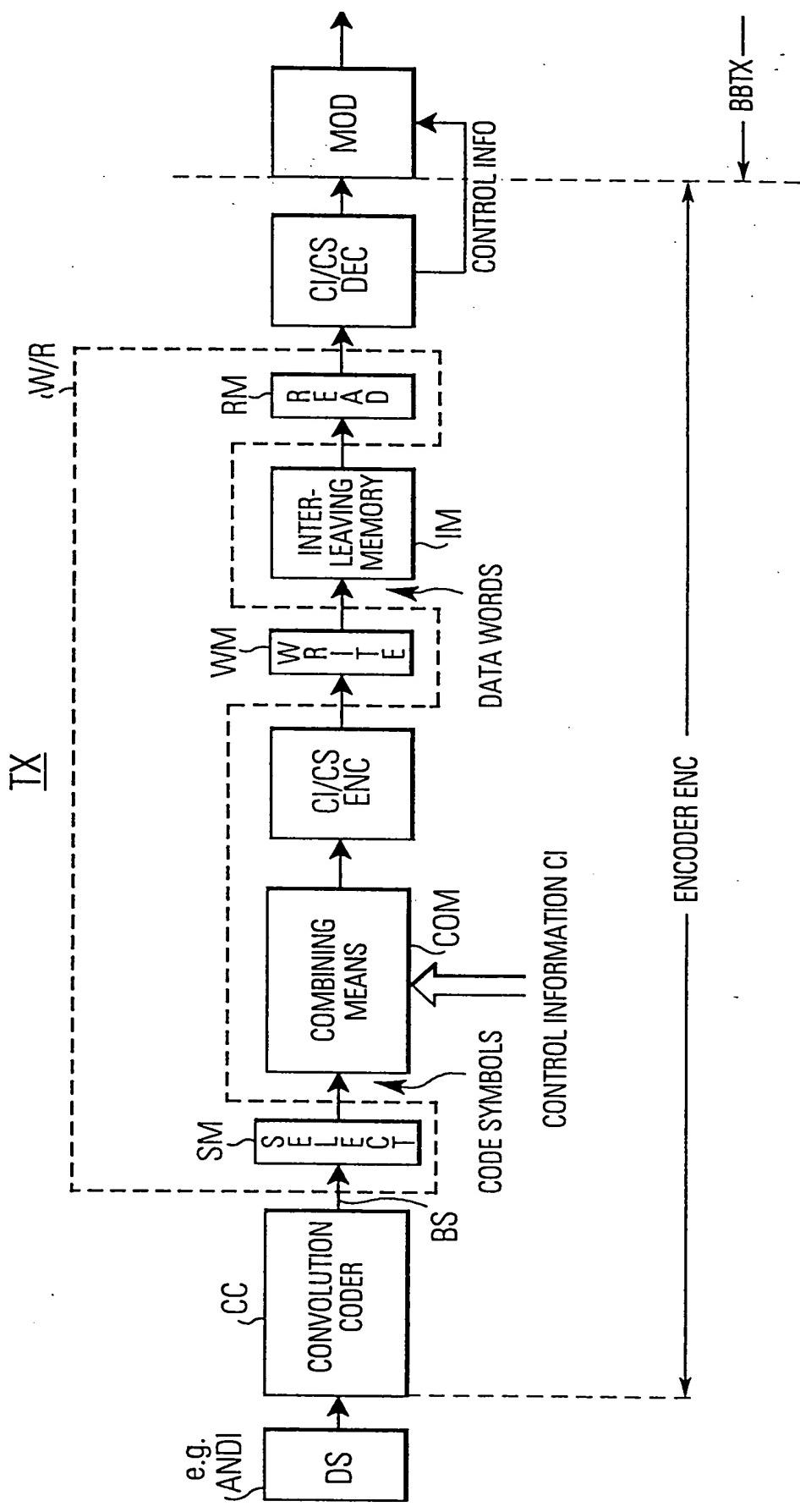


FIG.8

FS	SS	MA	PW	Q	I	ENCODED DATA VALUE(HEX)	FUNCTION
0	0	0	0	X	X	C	POWER OFF
0	0	0	1	0	0	0	NORMAL TRANSMISSION, I=0, Q=0
0	0	0	1	0	1	1	NORMAL TRANSMISSION, I=1, Q=0
0	0	0	1	1	0	2	NORMAL TRANSMISSION, I=0, Q=1
0	0	0	1	1	1	3	NORMAL TRANSMISSION, I=1, Q=1
0	1	0	0	X	X	D	SLOT START, POWER OFF
0	1	0	1	0	0	4	SLOT START, I=0, Q=0
0	1	0	1	0	1	5	SLOT START, I=1, Q=0
0	1	0	1	1	0	6	SLOT START, I=0, Q=1
0	1	0	1	1	1	7	SLOT START, I=1, Q=1
1	X	0	0	X	X	E	FRAME START, POWER OFF
1	X	0	0	0	0	8	FRAME START, I=0, Q=0
1	X	0	0	0	1	9	FRAME START, I=1, Q=0
1	X	0	0	1	0	A	FRAME START, I=0, Q=1
1	X	0	0	1	1	B	FRAME START, I=1, Q=1
X	X	1	1	X	X	F	MARKER FOR SPECIAL SYMBOL

TABLE 1: DATA ENCODING IN EXTERNAL RAM
(FS = FRAME START, SS = SLOT START, MA = MARKER, PW = POWER, X = DONT CARE)

FIG.9

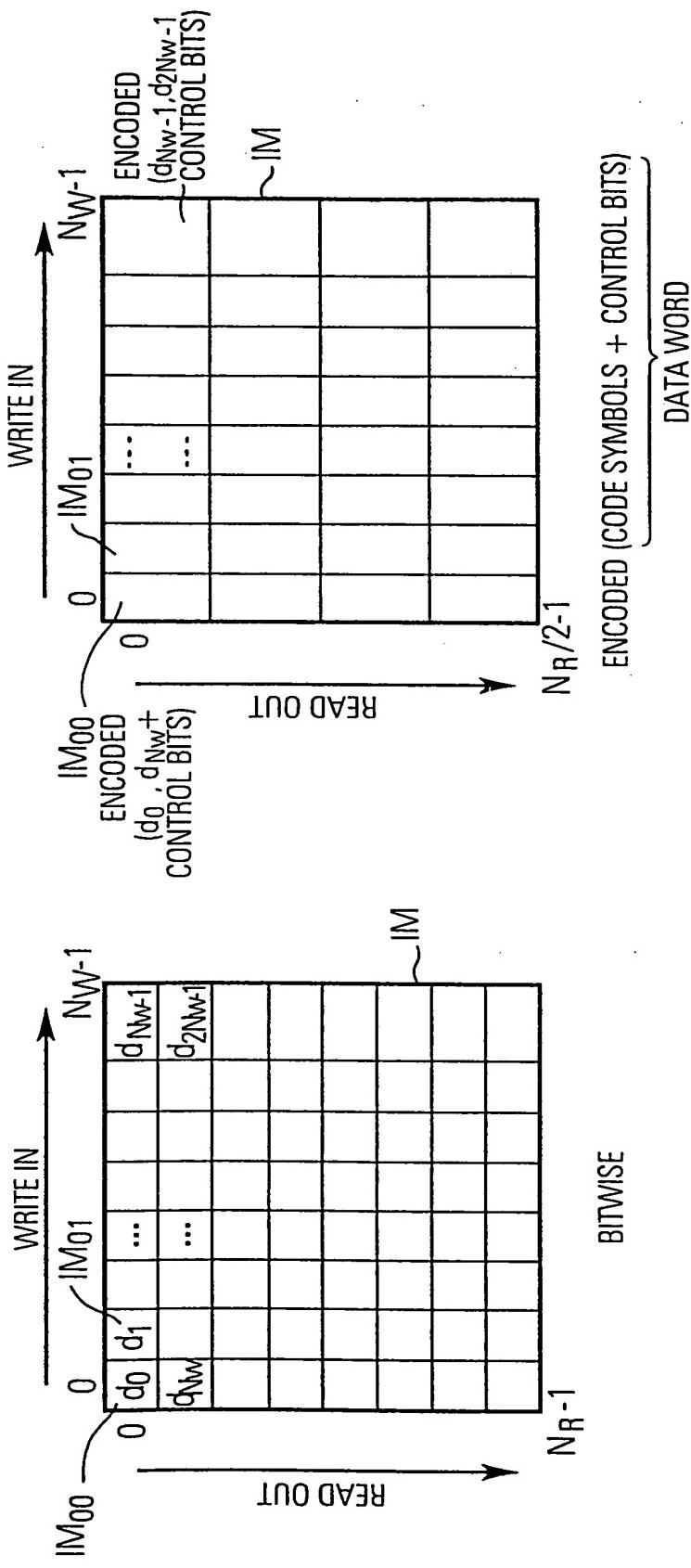
FUNCTION	ENCODED DATA VALUE(HEX)	FS	SS	MA	PW	Q	I
NORMAL TRANSMISSION, I=0, Q=0	0	0	0	0	1	0	0
NORMAL TRANSMISSION, I=1, Q=0	1	0	0	0	1	0	1
NORMAL TRANSMISSION, I=0, Q=1	2	0	0	0	1	1	0
NORMAL TRANSMISSION, I=1, Q=1	3	0	0	0	1	1	1
SLOT START, I=0, Q=0	4	0	1	0	1	0	0
SLOT START, I=1, Q=0	5	0	1	0	1	0	1
SLOT START, I=0, Q=1	6	0	1	0	1	1	0
SLOT START, I=0, Q=0	7	0	1	0	1	1	1
FRAME START, I=0, Q=0	8	1	1	0	1	0	0
FRAME START, I=1, Q=0	9	1	1	0	1	0	1
FRAME START, I=0, Q=1	A	1	1	0	1	1	0
FRAME START, I=1, Q=1	B	1	1	0	1	1	1
POWER OFF	C	0	0	0	0	0	0
SLOT START, POWER OFF	D	0	1	0	0	0	0
FRAME START, POWER OFF	E	1	1	0	0	0	0
MARKER FOR SPECIAL SYMBOL	F	0	0	1	1	1	1

TABLE 2: DATA DECODING

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FIG.5 PRIOR ART

FIG.10



$$n_W + (n_R + n-1) N_W + \\ n_R N_W (N - 1) = m$$

$$\begin{array}{c} n_W \\ \hline 0 & 1 & 2 & 3 \end{array} \quad N = 2 (\text{QPSK}) \quad N_W = 4$$

$n_R = 0$	{	0	1	2	3	$n = 1$
		4	5	6	7	$n = 2$
$n_R = 1$	{	8	9	10	11	$n = 1$
		12	13	14	15	$n = 2$
$n_R = 2$	{	16	17	18	19	$n = 1$
		20	21	22	23	$n = 2$
$n_R = 3$	{	24	25	26	27	$n = 1$
		28	29	30	31	$n = 2$
$n_R = 4$	{	32	33	34	35	$n = 1$
		36	37	38	39	$n = 2$
		40	41	42	43	
						:

FIG.11a

ONLY CODE
SYMBOLS ARE
SHOWN

BIT POSITION m
IN INPUT DATA
BIT SEQUENCE

n_W	$N = 4$ (e.g. 16 QAM)				$N_W = 4$
0	1	2	3		
$n_R = 0$	{	0	1	2	3
		4	5	6	7
		8	9	10	11
		12	13	14	15
$n_R = 1$	{	16	17	18	19
		20	21	22	23
		24	25	26	27
		28	29	30	31
$n_R = 2$	{	32	33	34	35
		36	37	38	39
		40	41	42	43

FIG.11b

ONLY CODE
SYMBOLS ARE
SHOWN

FIG. IIc
ONLY CODE SYMBOLS ARE SHOWN

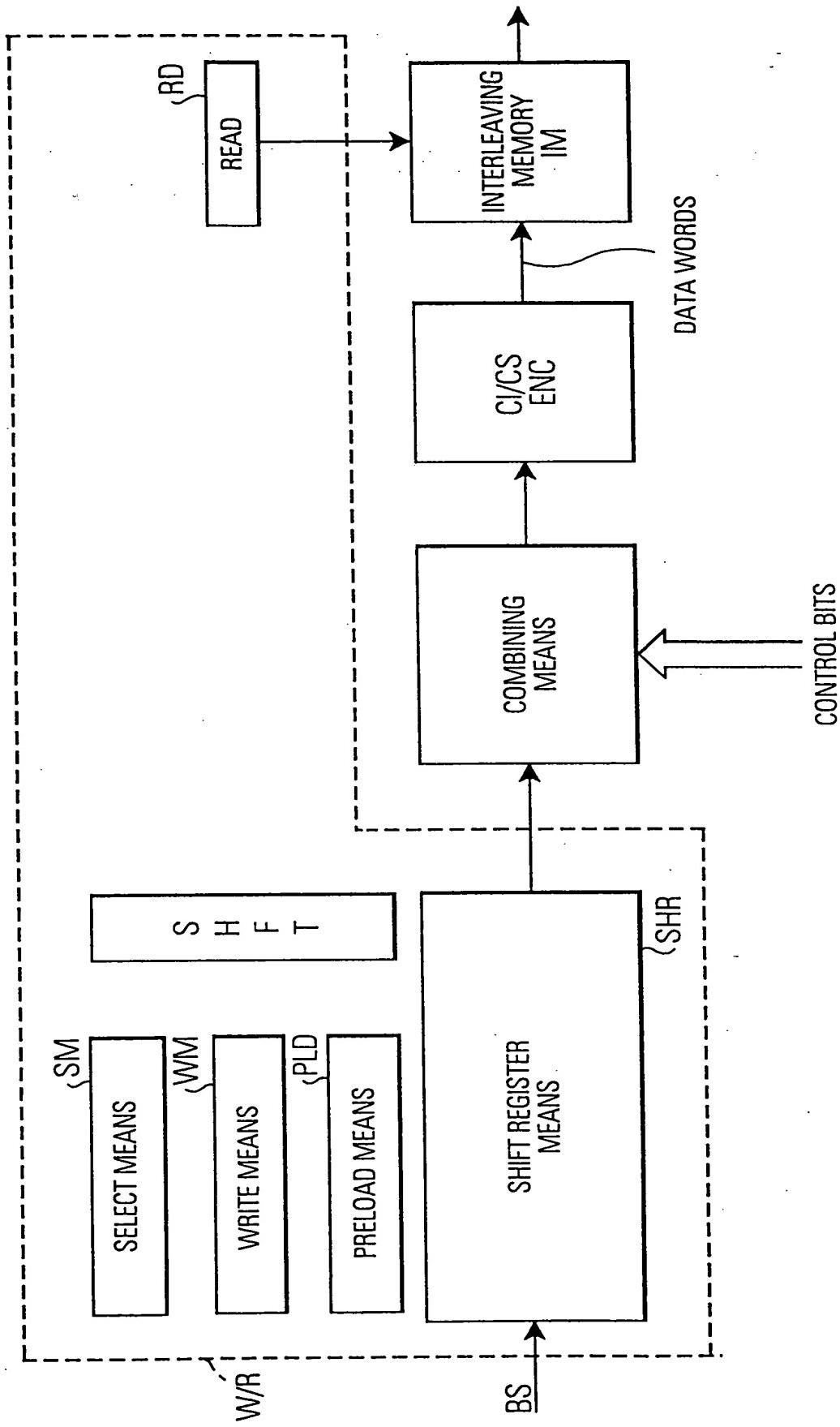
$$N = 2 ; N_W = 7$$

n_W	0	1	2	3	4	5	6
$n_R = 0$	0	1	2	3	4	5	6
	7	8	9	10	11	12	13
$n_R = 1$	14	15	16	17	18	19	20
	21	22	23	24	25	26	27

0 9 6 5 7 5 2 8 - 0 9 2 2 0 0

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FIG.12



002260 " 8252960

FIG.13a

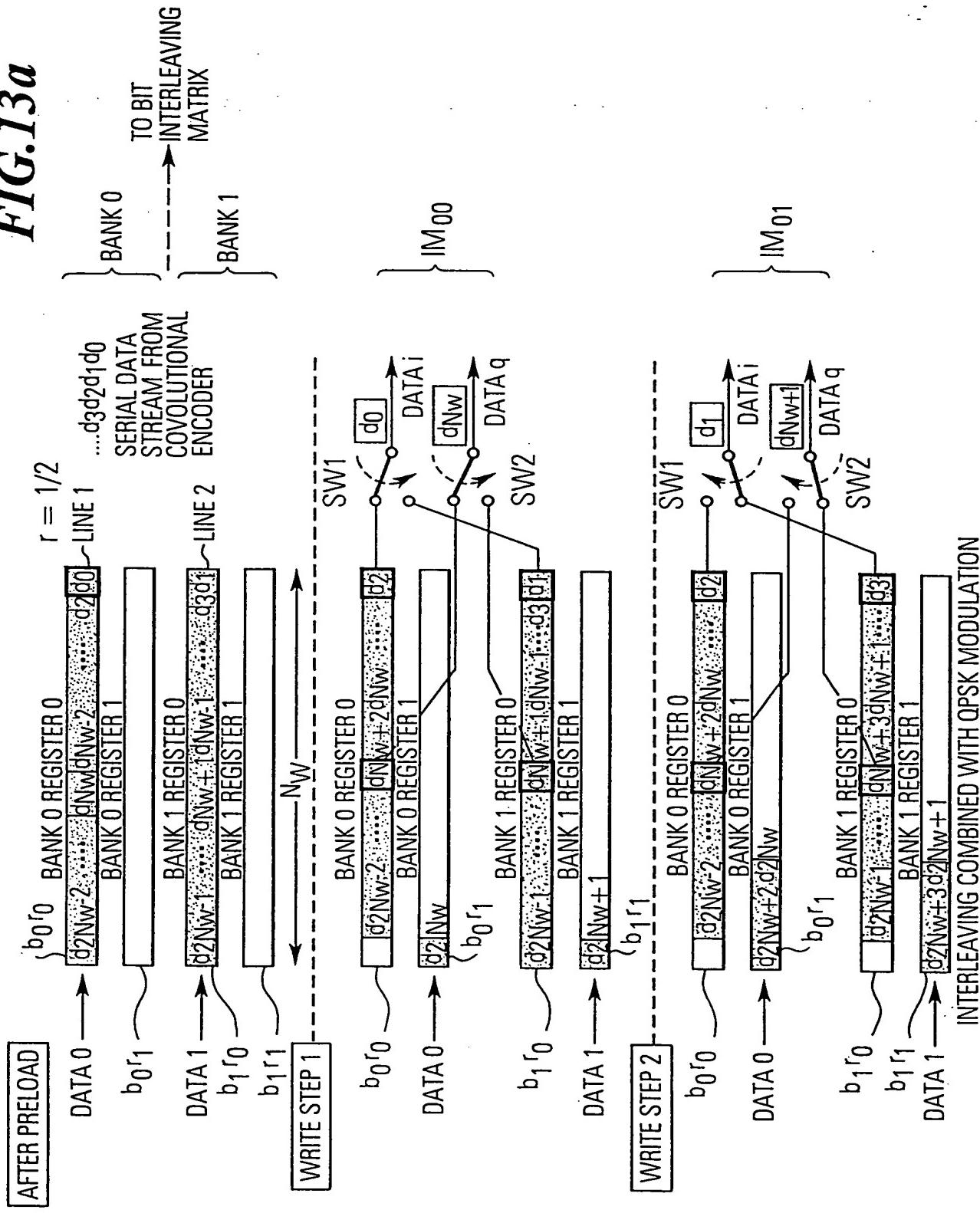
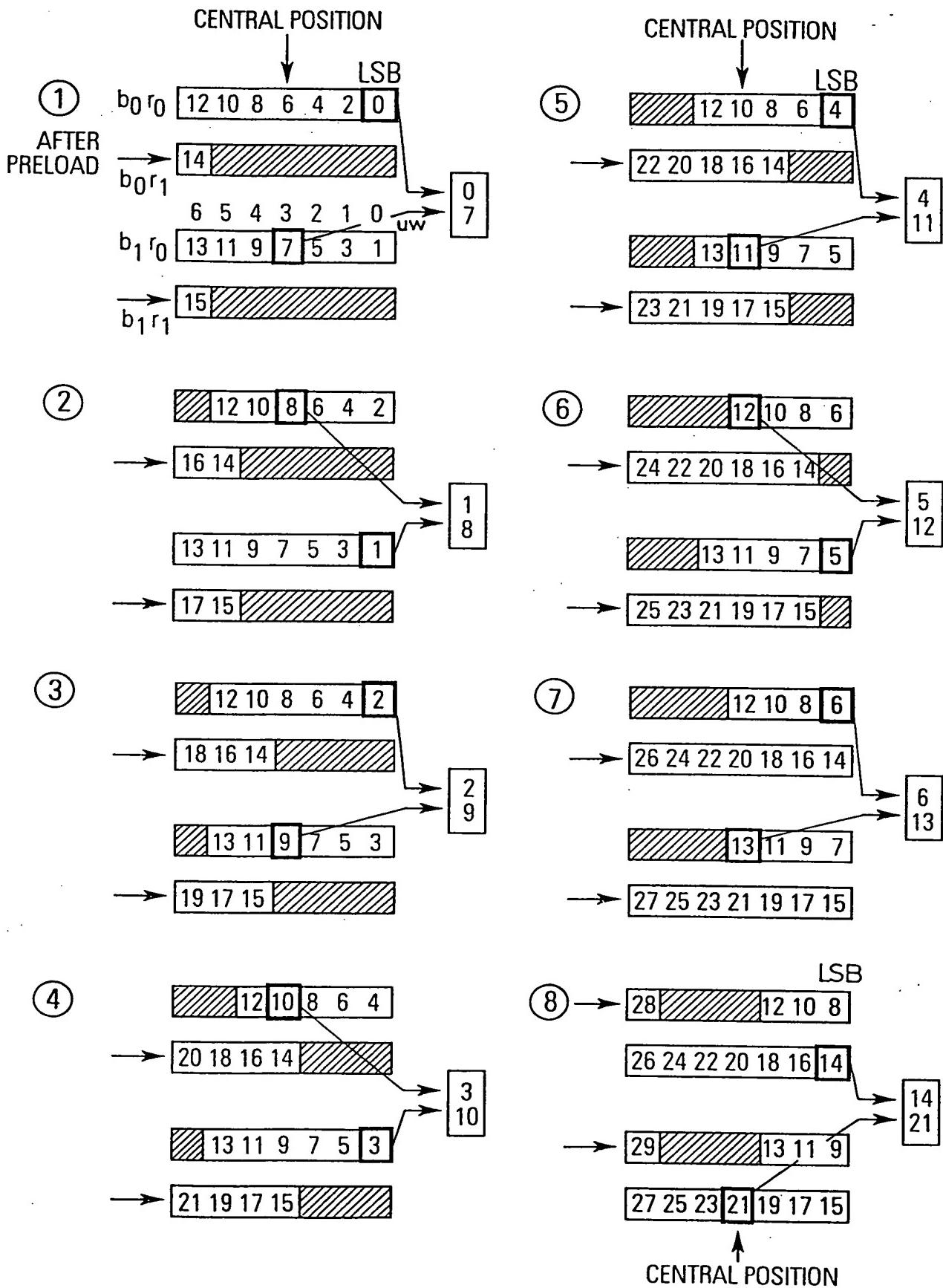


FIG.13b



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FIG.14

